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WRITING/KEYBOARD DUAL-PURPOSE COMPUTER

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WRITING/KEYBOARD DUAL-PURPOSE COMPUTER

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[There are no amendments to this patent.]

Claims

1. A type of writing/keyboard dual-purpose computer characterized by the following facts: the computer is comprised of computer main unit, keyboard, writing board, display screen, writing pen, and other part; this computer combines the writing input method and keyboard input method as one and can flexibly keep the machine in a state ready for writing operation or keyboard operation.
2. The computer described in Claim 1 characterized by the following facts: the writing board and the display screen are combined as one and placed in the display unit; the writing board is made of a transparent material that covers the front of the display screen; its resolution and coordinate system have exact correspondence with those of the display screen.
3. The computer described in Claim 1 characterized by the following facts: the display unit is connected to the main unit via a support arm; when the display unit is closed, the display unit covers the keyboard; when it is opened, the keyboard is exposed.
4. The computer described in Claim 1 characterized by the following facts: one end of the support arm is fixed on the side surface of the main unit and can rotate by a certain angle around

the pivot bolt of the main unit; the other end of the support arm is fixed on the side surface of the display unit and can rotate by a certain angle around the pivot bolt of the display unit.

5. The computer described in Claim 1 characterized by the following facts: when the lower edge of the display unit is placed behind the keyboard, the keyboard is exposed in front of the display unit, and the machine is in a state that facilitates keyboard operation; through the rotary movements between the support arm of the pivot bolt of the display unit and between the support arm of the pivot bolt of the main unit, the display screen can be set at an angle so that the user can view it conveniently; when the display unit is turned over, its lower edge moves forward; when a tongue piece on the display unit falls into the writing-position slot, the machine is in the optimum state for facilitating writing; if the tongue piece is pulled forward continuously instead of being fit into the writing-position slot, the display screen can cover the keyboard in parallel.

6. The computer described in Claim 1 characterized by the following facts: there is a latch tongue with an L-shaped straight hook installed on the display unit; a push pedal is installed on the latch tongue; the latch tongue can slide along a latch-tongue sliding rod; there is a latch-tongue spring at one end of the sliding rod; a lock slot is formed on the main unit; when the display unit is closed, the latch tongue is inserted into the lock slot to lock the machine with the aid of the L-shaped straight hook on the latch tongue; to open the machine, the user can push the push pedal to compress the spring; as a result, the latch tongue is unhooked and exits the lock slot so that the display screen can be opened.

7. The computer described in Claim 1 characterized by the following facts: when the display unit is closed, the tongue piece positioned on the rear edge of the display unit is fit into a closed-position slot on the main unit; at the same time, the latch tongue is inserted into the lock slot to lock the display unit and the main unit together.

8. The computer described in Claim 1 characterized by the fact that arm grooves are formed on both sides of the main unit, and the support arm is buried in the arm grooves when the display unit is closed.

9. The computer described in Claim 1 characterized by the fact that a hollow guiding slot is formed in the support arm, and all of the wires in the main unit and the display unit pass through the hollow guiding slot in the support arm.

10. The computer described in Claim 1 characterized by the following facts: there is a writing pen socket on the main unit; the writing pen is connected to the writing pen socket via a cable; the writing board can be used by inserting the writing pen into the writing pen socket.

11. A "writing and code combined" Chinese-character input method characterized by the following facts: this method uses the machine described in Claim 1; the writing board and the display screen are combined as one and placed in the display unit; the writing resolution and its

coordinate system have exact correspondence with those of the display screen; Chinese characters can be input using the whole-character writing method, sketching method, encoding method, or direct-touch method;

(1) triggering of the writing board by the input pen is divided into static triggering (spot triggering) and dynamic triggering (line triggering); the conversion between them is automatically judged and executed by the machine depending on the moving distance of the writing pen on the writing board;

(2) there is a radical display area on the display screen; there are several frequently used radicals in that area, which are divided into five types, that is, horizontal stroke, vertical stroke, left-falling stroke, right-falling stroke, and turning stroke according to the attribute of the first stroke; one or more radicals are marked in each small section in that area;

(3) when a small section in the radical display area is touched, the corresponding radical will be selected; if the needed Chinese character is the radical itself, it will be accepted; if the needed Chinese character is comprised of several radicals, there are two types of code input methods:

(1) the Chinese character is selected after selecting all of the code elements;

(2) every time when a code element is touched, the machine displays all or some (through page switching) of the coincident codes that might be present in that intermediate state in the prompt line; they can be arranged according to the attribute of the first stroke, the number of strokes, or the first letter of the phonetic transcription so that the user can make a selection; to select a character, the user needs only to touch that character with the pen;

(4) when writing a Chinese character in the radical area (that is, draw), a header is used to define the radical; the user can input the Chinese character by only writing one or more strokes in addition to that radical; if there are coincident codes, the Chinese characters with the coincident codes will be arranged in the prompt line according to the attribute of the first stroke, the number of strokes, or the first letter of the phonetic transcription so that the user can make selection; the user needs only to touch the needed Chinese character with the writing pen; otherwise, the selected Chinese character jumps into the text directly;

(5) when executing the sketching function, once the header is defined, an abnormality is immediately present in the small section where that header is positioned; either only that small section is left in the radical area, or all other parts are hidden;

(6) there are display areas for highly-frequency Chinese characters, English letters, and frequently used punctuation marks, which are divided into several small sections; it is possible to input the corresponding character when touching said small sections using the writing pen;

(7) the machine executes the whole-character writing function when it is subjected to line triggering in the area outside the radical area; in this case, there is no response anywhere in the

radical area, or the entire radical area is hidden; after the user finishes writing a Chinese character, he or she can input that Chinese character by touching the "END" key.

### Specification

Since the laptop computer was invented, its sales volume have increased significantly. Since it has the same functions as a normal computer with a much smaller size, it is considered an innovation in the computer industry. As the size is reduced and more functions are added, the applications of [laptop] computers are being popularized rapidly. In the meantime, expansion of the application field and the use objects lead to a change in the interface method between human and computer. Currently, research and development of handwriting-input computers (or known as pen-type input computer) are growing rapidly. Handwriting-computers have the following advantages.

1. Friendly interface between human and computer. Anybody who can write can operate a computer.
2. The keyboard becomes the bottleneck in the trend of miniaturizing computers. The introduction of a handwriting-input plate is one resolution.
3. It becomes more convenient and direct to create tables or draw diagrams.
4. An input pen is more flexible and effective than mouse because of its fast fixed-point function.

Both Sony and Canon of Japan have marketed innovative computers, which can identify Chinese characters in a less than perfect way and can, relatively slowly, read hand-written Chinese characters and convert them into computer data. However, this type of computer developed in Japan is currently limited to the Japanese market only. Also, it has very strict writing restrictions since it can identify only a very limited number of Chinese characters. GRID Corporation of the USA also developed a handwriting computer in September 1989. This type of computer can identify nine types of western characters. GO Corporation of USA also developed a PEN POINT type computer that can input characters using a standard writing method early in 1991. This type of computer can identify block letters, numbers, and all punctuation marks.

Currently, all of the laptop computers and notebook or portable computers use either keyboard input method or handwriting input method as the only input method. This not only limits the objective uses of the computers but also makes it impossible to fully display the functions of the computers. As far as the handwriting input method and the keyboard input method are concerned, it is more convenient to use the former for executing some software functions, while it might be better to use the latter for executing some other functions. This is dependent on not only the user but also on the function to be executed. For example, a typist can input a document much faster using the keyboard than using the handwriting method. However,

when editing a document, it is more convenient and direct to operate with an electronic pen directly on the display screen.

The present invention pertains to a writing/keyboard dual-purpose personal computer characterized by the fact that this computer combines the writing input method and keyboard input method as one and can flexibly keep the machine in a state that enables writing operation or keyboard operation. The present invention also provides a design idea that can realize "writing and code combined" Chinese-character input method on a computer, wherein a writing board is integrated with the display screen.

Figures 1-4 show the appearance of the present invention. Figure 1 shows the appearance when the computer is locked. Figure 2 shows the appearance when the computer is in a state enabling keyboard operation. Figures 3, 4 show the appearance when the computer is in a state enabling handwriting operation. The working theory is as follows.

This computer is comprised of main unit (11), display unit (1), keyboard (5), display screen and writing board (3), internal constituent parts, and hardware circuits. The keyboard is installed on the base seat of the main unit. When the display unit is closed, it covers the keyboard. When the computer is in use, the display unit is lifted to expose the keyboard. The display unit has a liquid crystal display screen. A transparent writing board is installed in front of the display screen. The resolution of the liquid crystal display screen is on exactly the same plane as the resolution of the writing board. The computer is equipped with a writing pen (8). When the electronic-touch method is adopted, the writing pen is connected to a plug (14) via a conducting wire. The plug can be inserted into writing pen socket (13) on the main unit.

Support arms (4), (10) are installed on both sides of the main unit. One end of the support arm is fixed on the main unit via main unit pivot bolt (16). The support arm can rotate by a certain angle around this pivot bolt. The other end of the support arm is fixed on the display unit via display unit pivot bolt (15). The support arm can also rotate by a certain angle around this pivot bolt. Hollow slots are formed at the ends of the support arm. The support arm has screw threads. Positioning screws (17) are screwed on the pivot bolts through the round holes at the ends of the support arm, as shown in Figure 5. There are two arm grooves (12) on both sides of the main unit. The shape of the arm grooves matches that of the support arm. When the display unit is closed, the support arms are buried in the arm grooves.

When the keyboard input method is used, the display screen is raised and can rotate by a certain angle, as shown in Figure 2. When the input method that facilitates writing is adopted, the bottom part of the display unit is moved forward so that tongue piece (18) falls into writing-position slots (7) (19), as shown in Figure 3. Figure 7 shows the state when the tongue piece falls into the writing-position slot. If the tongue piece is pulled further forward without falling into the writing-position slot, the display screen will cover the keyboard in parallel, as shown in Figure 4.

Since design of the coupling part between the side surface of the display unit and the support arm adopts the structure shown in Figure 6, rotation of the display screen with respect to the support arm has two limit positions indicated by the broken lines in the figure. There is a hollow guiding slot in the support arm. All of the wires of the parts in the main unit and display unit are guided through this slot. There are latch tongues (2), (22) with an L-shaped straight hook on each side of the display unit. Push pedals (9), (24) are installed on the latch tongues. The latch tongue can slide along sliding rod (23). There is a latch tongue spring (25) at one end of the sliding rod, as shown in Figure 9. There is a lock slot (6) on the main unit. When the display unit is closed, the side with the display screen faces down, and the tongue piece on the back edge of the display unit is directed at the closed-position slot (21) on the back of the main unit, as shown in Figure 8. The display unit and the support arms are in the same plane, as indicated by the solid lines in Figure 6. The latch tongue falls into the lock slot. The computer is locked by the L-shaped straight hook on the latch tongue. In the meantime, since the tongue piece of the display unit is fit into the closed-position slot, the entire machine can be locked.

When the machine is opened, the push pedals on both sides of the main body are pushed forward to make the latch tongue leave the lock slot so that the display unit can be raised.

Since the display screen is integrated with the writing board and they have exactly the same resolution, the tracks of the electronic pens are reflected synchronously on the display screen. This greatly facilitates input of characters, diagrams, and various types of coordinate information. The present invention provides a design that can realize "writing and code combined" Chinese-character input method on this writing, display system. This input method is disclosed in Chinese Patent Application 88104202 [title of the patent: "Writing and code combined" Chinese character, diagram input keyboard, inventor: Zhu Dequan]. This input method has the following main points.

1. Triggering of the input pen is divided into static triggering (spot triggering) and dynamic triggering (line triggering). The conversion between them is automatically judged and executed by the machine.
2. There is a radical area on the writing board. One or more radicals are marked in each small section in that area. When these small sections are touched, the corresponding radical will be selected. When executing line triggering, a header is used to define the radical. In order to input a Chinese character it is only necessary to write one or more strokes in addition to that radical. The aforementioned header is the coordinates of the starting point of the first stroke.
3. If the first stroke is started in the area outside the radical area, the user should finish writing the entire Chinese character and provide a termination signal (for example, press the "END" key). The machine will identify that Chinese character and output the corresponding codes.

4. Each Chinese character is sequentially divided into several elements defined on the writing board according to the maximum part dividing principle. Then, the user can input the codes of that Chinese character by touching these square sections.

The present invention provides a method for realizing the “writing and code combined” patent on a computer with integrated display screen and writing board and further explains this input method.

First, the radical area is not printed on the display screen or the writing board. It is directly displayed using the display screen. In this way, it is possible to display or delete the radical area quickly at any time. When executing the Chinese-character-input function, the radical area is present at the bottom of the screen. All of the radicals in that area are divided into five types, that is, horizontal stroke, vertical stroke, left-falling stroke, right-falling stroke, and turning stroke, according to the attribute of the first stroke. For example, “一,” “木,” etc., belong to the horizontal stroke area, while “马,” “女,” etc. belong to the turning stroke area.

When inputting a Chinese character, if the starting point of the first stroke is located in the square section of a certain radical (that is, the header defines that radical), abnormality is present in the square section where that radical is located. For example, that square section is displayed in a different color, or only that square section is left in the radical area, while other sections are hidden. This change will clearly remind the user that the header has defined this type of radical. When the user uses the pen to touch a certain square section in the radical area, the same abnormality will be present in that square section. When a Chinese character is written in the area outside the radical area, there is no response anywhere in the radical area, or the entire radical area is hidden.

Also, according to the present invention, when the users writes the first stroke of a Chinese character (that is, sketches) in the radical area, he (or she) only writes the stroke in addition to the type of radical defined by the header. The number of the strokes can be one or more. When writing the first stroke, if there is no other choice, that Chinese character will be inserted into the main text. If there are other choices, all or some (through page switching) of the choices are displayed in the prompt line. They can be arranged according to the attribute of the first stroke, the number of strokes, or the first letter of the phonetic transcription so that the user can make selection. To select a character, the user needs only to touch that character with the pen. There is no need to move the cursor or number these choices and then input the corresponding the number. Therefore, it is very convenient. If there are too many choices, the user can write the second stroke, the third stroke, etc., after the written first stroke according to the stroke sequence. As the number of strokes increases, the available choices will be reduced



significantly. In fact, most of the Chinese characters can be selected after the third stroke, or [at least] only very few choices are left.

When executing the encoding method, each Chinese character is sequentially divided into several elements defined on the writing board according to the maximum part dividing principle. The following two encoding methods are provided.

1. The Chinese character is selected after selecting all of the code elements;
2. Every time a code element is touched, the machine displays all or some (through page switching) of the coincident codes that might be present in that intermediate state in the prompt line; they can be arranged according to the attribute of the first stroke, the number of strokes, or the first letter of the phonetic transcription so that the user can make a selection. To select a character, the user needs only to touch that character with the pen.

There are display areas for high-frequency Chinese characters (several Chinese characters that are used most frequently), English letters, and frequently used punctuation marks, which are divided into several small sections. It is possible to input the corresponding character when touching said small sections using the writing pen.

The structural design for the writing/keyboard dual-purpose computer disclosed in the present invention can be used not only for notebook computers but also for other portable computers, such as palm-sized computers. The Chinese-character input method described in the present invention is applicable to any computer with an integrated display screen and writing board.

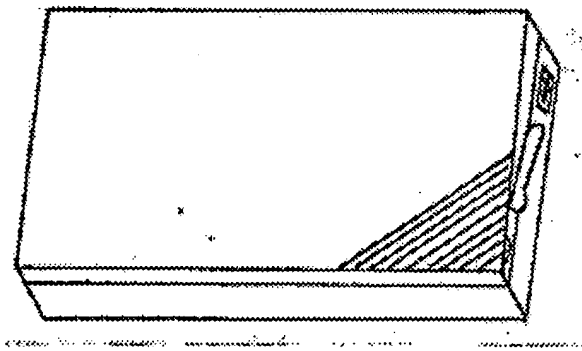


Figure 1

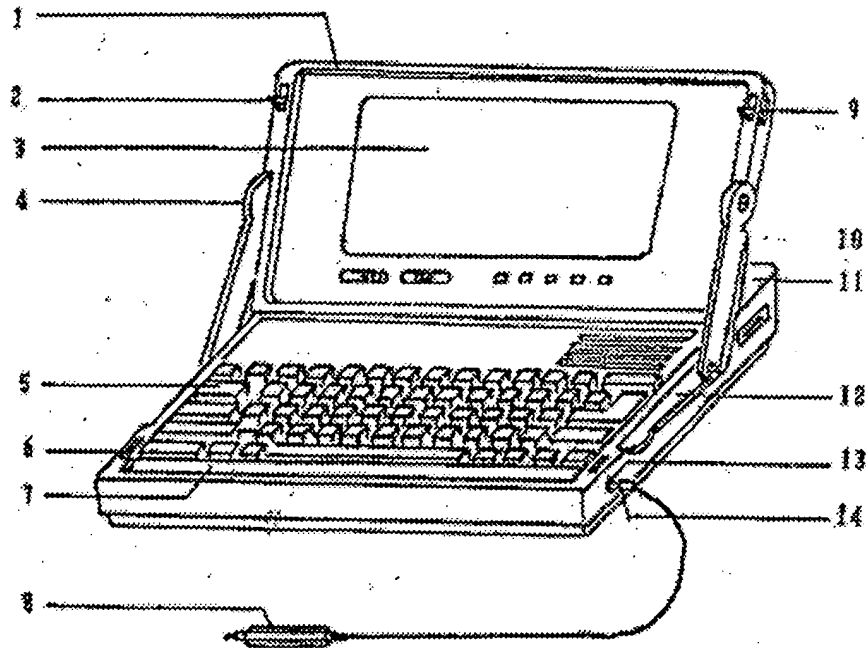


Figure 2

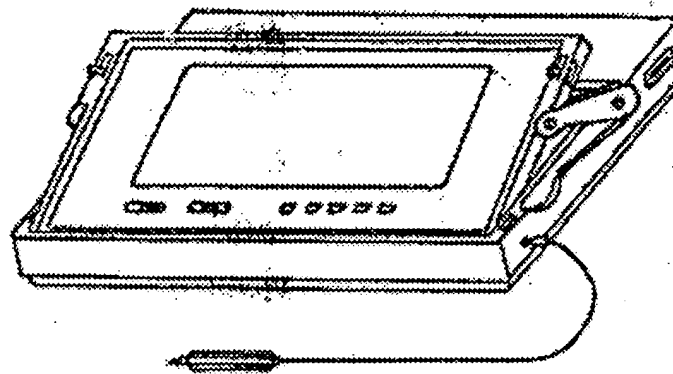


Figure 3

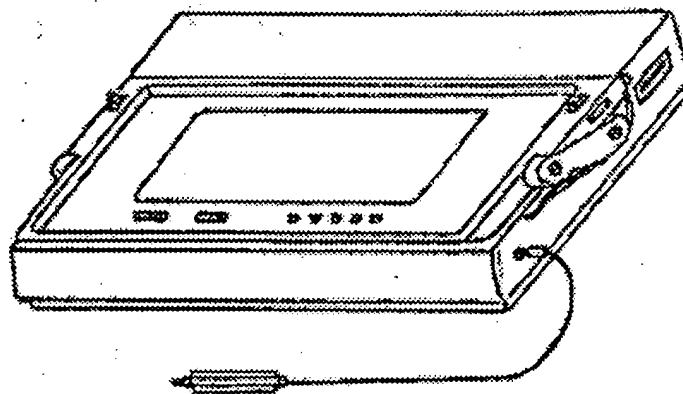


Figure 4

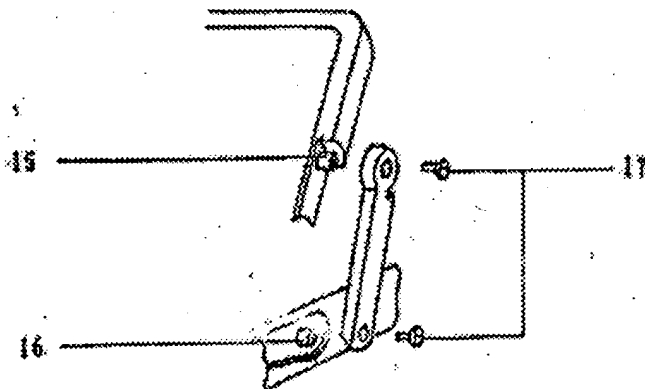


Figure 5

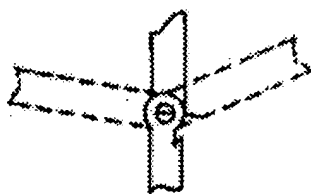


Figure 6



Figure 7

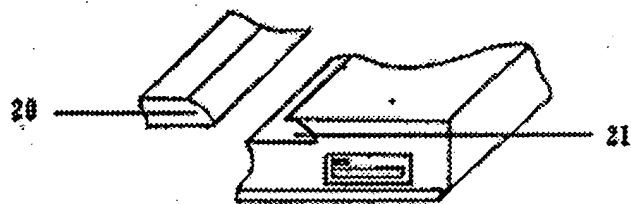


Figure 8

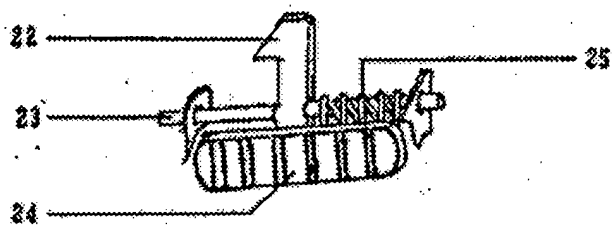


Figure 9